WHAT IS CLAIMED IS:

1. An apparatus for remotely controlling household appliances, comprising:

5    a first network processor for performing remote communication with an external Internet network to receive external remote control information therefrom, said first network processor being connected to a home network to transmit the received remote control information to an

10   associated one of said household appliances and receive information regarding a current state of each of said household appliances to transmit the received state information to said external Internet network; and

a plurality of second network processors each connected

15   between the output of said first network processor and the input of an associated one of said household appliances via a power line for receiving said remote control information from said first network processor and transmitting the state information of the associated household appliance to said

20   first network processor.

2. The apparatus as set forth in Claim 1, wherein said first network processor includes a transmitter/receiver module provided at its output stage for performing information

25   transmission and reception operations with said second network

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processors over said power line, and each of said second network processors includes a transmitter/receiver module provided at its input stage for performing information transmission and reception operations with said first network
5   processor over said power line.

3. The apparatus as set forth in Claim 1, wherein each of said second network processors includes a communication module installed in the associated household appliance and connected
10  directly to said home network constructed among said household appliances using said power line, for generating information about an operating state of the associated household appliance and user notification information according to characteristics of the associated appliance.
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4. The apparatus as set forth in Claim 3, wherein a specific one of said second network processors includes a screen display communication module installed in a screen displayable one of said household appliances for collecting
20  the operating state information and user notification information generated by said communication modules, analyzing the collected information and displaying the analyzed results on a screen of the displayable household appliance to provide a visual indication thereof to a user.
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5. The apparatus as set forth in Claim 3, wherein each of said communication modules includes:

an insulation transformer for performing a signal transformation operation to smooth the flow of information between the associated household appliance and said power line; and

a signal processor for generating the operating state information of the associated household appliance and user notification information according to the characteristics of the associated appliance, appending a unique code assigned to the associated household appliance to the generated operating state information and user notification information, transmitting the resulting information through said insulation transformer, receiving said remote control information through said insulation transformer, extracting said unique code from the received remote control information and then processing said remote control information.

6. The apparatus as set forth in Claim 4, wherein said screen display communication module includes:

an insulation transformer for performing a signal transformation operation to smooth the flow of information between said specific household appliance and said power line; and

a signal processor for generating the operating state

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information of said specific household appliance and user notification information according to the characteristics of said specific appliance, appending a unique code assigned to said specific household appliance to the generated operating state information and user notification information, transmitting the resulting information through said insulation transformer, receiving said remote control information through said insulation transformer, extracting said unique code from the received remote control information and then processing said remote control information.

7. The apparatus as set forth in Claim 6, wherein said screen display communication module further includes means for analyzing said user notification information and flickering information displayed on the screen or varying the color thereof if the analyzed result indicates an urgent situation.

8. An apparatus for remotely controlling at least one household appliance, comprising:

a built-in Web server installed in said household appliance for assigning an Internet protocol (IP) address to said household appliance and extracting control information associated with the assigned IP address from a control signal sent through an external communication network; and

a household appliance control unit for controlling the

entire operation of said household appliance according to the control information extracted by said built-in Web server.

9. The apparatus as set forth in Claim 8, wherein said built-in Web server includes:

a communication interface for interfacing said household appliance to said external communication network;

a communication controller for receiving said control signal through said communication interface and extracting said control information from the received control signal; and

a communication memory for storing a program for processing said control information extracted by said communication controller and transferring the processed control information to said household appliance.

10. The apparatus as set forth in Claim 9, wherein said communication interface includes a transformer for performing a signal transformation operation such that said control information is extracted from said control signal sent through said external communication network.

11. The apparatus as set forth in Claim 9, wherein said communication interface includes an address memory for storing MAC address information for identification of said household appliance and said IP address assigned to said appliance

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through said built-in Web server on the basis of the MAC address information.

12. The apparatus as set forth in Claim 11, further comprising a service provider for assigning said IP address to said household appliance on the basis of said MAC address information of said appliance stored in said addresses memory.

13. The apparatus as set forth in Claim 12, wherein said service provider is adapted to prestore MAC addresses of household appliances to which IP addresses are to be assigned, and assign IP addresses to said household appliances only when they have the prestored MAC addresses.

14. The apparatus as set forth in Claim 8, further comprising:
a display processor for displaying information about the entire operation of said household appliance, controlled by said household appliance control unit according to said control information extracted by said built-in Web server.

15. The apparatus as set forth in Claim 14, wherein said household appliance control unit is adapted to generate the information about the entire operation of said household appliance controlled according to said control command and

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transfer the generated information to an external user via an communication interface and external communication network.

16. The apparatus as set forth in Claim 15, wherein said display processor includes:

a key input unit for inputting a key command signal according to a user's key operation;

a display panel for displaying the information about the entire operation of said household appliance controlled according to said key command signal inputted by said key input unit and said control information extracted by said Web server; and

a microcomputer for processing the operation information of said household appliance and displaying the processed information on said display panel.

17. The apparatus as set forth in Claim 8, wherein said household appliance control unit includes:

a relay for operating said household appliance; and

a switch for turning on or off said relay according to said control information from said built-in Web server.

18. The apparatus as set forth in Claim 8, wherein said household appliance control unit includes:

a triac for operating said household appliance; and

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a switch for turning on or off said triac according to said control information from said built-in Web server.

19. A method for remotely controlling at least one household appliance, comprising the steps of:

a) allowing a user to call an IP address of said household appliance over an Internet network to control said appliance;

b) running a program for control of said household appliance in a personal computer of said user;

c) allowing said user to enter a control command for said household appliance according to said program run at said step b);

d) controlling said household appliance in response to said control command entered at said step c); and

e) transmitting information about the entire operation of said household appliance controlled at said step d) to said user so that he or she can recognize it.

20. The method as set forth in Claim 19, wherein said step d) includes the step of, if said user enters no control command for said household appliance at said step c), transmitting information about a current state of said household appliance to said user so that he or she can recognize it.

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21. A method for remotely controlling at least one household appliance, comprising the steps of:

a) constructing a service provider for storing a MAC address, assigned to said household appliance upon being manufactured and sold, and assigning an IP address to said appliance on the basis of the stored MAC address;

b) allowing said service provider constructed at said step a) to, when said household appliance is connected to an external communication network, sense a MAC address of said appliance and determine whether said appliance requests an IP address assignment;

c) allowing said service provider to compare said MAC address sensed at said step b) with said MAC address stored at said step a) if it is determined at said step b) that said appliance requests the IP address assignment; and

d) allowing said service provider to assign an IP address to said household appliance if said sensed MAC address is determined to be the same as said stored MAC address from the result compared at said step c), and to return to said step b) if said sensed MAC address is determined not to be the same as said stored MAC address.

22. An apparatus for remotely controlling at least one household appliance, comprising:

a household appliance microcomputer for controlling the

operations of various components in said household appliance, checking operating states of said components and generating fault/repair information in accordance with the checked results;

5       a network processor for communicating with said household appliance microcomputer and calling a repair service over an Internet network upon receiving said fault/repair information from said microcomputer; and

       a communication controller connected between said

10  household appliance microcomputer and said network processor for performing a communication processing function and signal coupling function therebetween.

       23. The apparatus as set forth in Claim 22, further

15  comprising a service center responsive to an automatic service call from said network processor for receiving records of a fault of said household appliance and repairing the fault.

       24. The apparatus as set forth in Claim 22, wherein said

20  network processor includes:

       a network interface for interfacing said household appliance to said Internet network; and

       a network controller for communicating with said household appliance microcomputer via said communication

25  controller, generating a predetermined service call upon

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receiving said fault/repair information from said microcomputer, and transmitting and receiving a variety of information over said Internet network.

5        25. The apparatus as set forth in Claim 22, wherein said communication controller includes:

a pair of communication processors connected respectively to said network processor and household appliance microcomputer for performing said communication processing
10   function therebetween; and

a power processor connected between said communication processors for performing a power ON/OFF function to prevent a mismatch between a power line and a signal line.

15       26. The apparatus as set forth in Claim 22, wherein said household appliance microcomputer is adapted to check the operation of said household appliance and generate information about the use of said appliance as a result of the checking, and said network processor is adapted to transmit and receive
20   a variety of control information, containing the use information generated by said microcomputer, over said Internet network.

27. The apparatus as set forth in Claim 26, further
25   comprising:

a communication terminal for calling said household appliance to transmit remote control information from a user to said appliance; and

a communication service provider for accommodating said
5  user as a subscriber of said communication terminal and transmitting said remote control information from said user to said household appliance.

28. The apparatus as set forth in Claim 27, wherein said
10 communication service provider and said communication terminal are interconnected via a wired cable.

29. The apparatus as set forth in Claim 27, wherein said communication service provider and said communication terminal
15 are interconnected in a wireless manner.

30. The apparatus as set forth in Claim 29, wherein said household appliance includes:

a radio antenna for transmitting and receiving radio
20 communication data to/from said communication service provider; and

a radio transmitter/receiver module for processing said radio communication data transmitted and received between said radio antenna and said network processor.

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31. The apparatus as set forth in Claim 29, wherein said household appliance includes:

a radio antenna for transmitting and receiving radio communication data to/from said communication service
5 provider; and

a home server acting as a relay between said Internet network and a home network for connecting said radio communication data, transmitted and received through said radio antenna, to said home network; and
10 a transmitter/receiver module connected to said household appliance via network transfer media for transferring information between said home server and said appliance.


32. The apparatus as set forth in Claim 31, wherein said
15 network transfer media of said transmitter/receiver module include a power line and an Internet dedicated line, said Internet dedicated line being an asymmetric digital subscriber line.


20 33. A method for remotely controlling at least one household appliance, comprising the steps of:

a) controlling the operations of various components in said household appliance, checking operating states of said components and generating fault/repair information upon
25 occurrence of a fault in said appliance;

b) performing a communication processing function and a signal coupling function to generate an automatic service call according to said fault/repair information generated at said step a);

5    c) gaining access to a service center over an Internet network using a unique identification code and transmitting fault/repair records to said service center; and

d) allowing said service center to receive the transmitted fault/repair records if said unique identification 10   code is valid and then to display a reception acknowledgement message containing information about a visit time of a repairman and the degree of said fault.